(19) World Intellectual Property Organization

International Bureau





(43) International Publication Date 8 July 2004 (08.07.2004)

PCT

(10) International Publication Number WO 2004/057255 A1

(51) International Patent Classification7:

F26B 3/00

(21) International Application Number:

PCT/US2003/040646

(22) International Filing Date:

19 December 2003 (19.12.2003)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

60/435,015

19 December 2002 (19.12.2002) US

- (71) Applicant (for all designated States except US): KARGES-FAULCONBRIDGE, INC. [US/US]; 1983 Sloan Place, Suite 3, St. Paul, MN 55117 (US).
- (72) Inventor; and
- (75) Inventor/Applicant (for US only): WILLS, Robert, A. [US/US]; 2730 92nd Crescent N., Brooklyn Park, MN 55443 (US).
- (74) Agent: BRUESS, Steven, C.; Merchant & Gould P.C., P.O. Box 2903, Minneapolis, MN 55402-0903 (US).

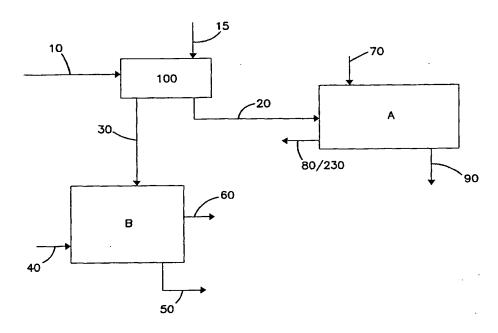
- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (regional): ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: SYSTEM FOR LIQUID EXTRACTION, AND METHODS



(57) Abstract: A process for removing water from solid material (10) using liquid-solid extraction and liquid-liquid extraction in an extraction system (100). Multiple solvents are used sequentially to replace the water with a first solvent, then replacing that solvent with a second solvent, etc., then eventually removing the last solvent from the solid materials. The solvents have progressively lower heats of vaporization, enthalphy of vaporization, boiling point or related property, so as to conserve use of thermal energy.

004/057255 A1